Saskatchewan
Parks and
Renewable
Resources

Hon. Colin Maxwell
Minister

# Aquaculture Development In Saskatchewan

## A Position Paper

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## Preface

Commercial aquaculture is emerging as a new industry with apparently exciting possibilities for growth, new employment and investment.

In some countries aquaculture has been developing rapidly. In Canada slower growth has given rise to concern that opportunities are being lost. With this in mind, a number of agencies have examined or are in the process of examining how aquaculture development can best be stimulated.

This paper is a development proposal for aquaculture in Saskatchewan. Its main thrust calls for development to be driven by the private sector. The government's role is to provide a positive development climate, as well as research and extension support.

We are asking for public input to determine support and suggested improvements to the plan.

Please send your comments or suggestions by **August 15, 1986** to:

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# Aquaculture Development In Saskatchewan

## Background

**"Aquaculture"** is defined as the husbandry (farming) of finfish, shellfish and aquatic plants. In Saskatchewan, the farming of such aquatic plants as wild rice has already evolved to the production stage. For this reason, the focus of this paper is on the development of aquaculture using finfish, shellfish and crustaceans.

On a world scale, aquaculture production was estimated at 10 million tonnes in 1984, accounting for 10 to 12 percent of the total fish produced (the other 88 to 90 percent being wild harvest). China and Japan account for 35 percent of world aquaculture production. The United States, at 200,000 tonnes, produces only 2% of the world total.

By way of comparison, Canadian aquaculture production in 1984 was estimated at only 6000 tonnes, less than 1/10 of 1% of the world total. This low level of development can be attributed to our harsh winter climate and relatively abundant wild fish resource, which has to date been able to meet the public demand for fish products. The most commonly cultured species in Canada include Atlantic and Pacific salmons, trout, mussels and oysters.

In Saskatchewan, aquaculture is practised by about 2200 participants annually. The vast majority of these operate on a "hobby" basis, raising only enough fish for themselves and their friends to eat. In 1985, 93 commercial aquaculture licences were issued, resulting in an estimated production of 14.4 tonnes (14,400 kg).

Rainbow trout is the only species of fish currently cultured in Saskatchewan. Most are stocked in dugouts and potholes in the spring, and harvested in the fall or early winter after one season's growth. This method of releasing free-roaming fish into a waterbody to grow on natural foods is termed **extensive** aquaculture. Recovery rates average 30 to 35 per cent.

**Intensive** aquaculture, on the other hand, has the potential to harvest 80 to 90 percent of fish stocked. In an intensive system fish are raised in a closed environment, where variables influencing fish growth and survival can be manipulated or controlled; these include feeding rate, water temperature, dissolved oxygen, light intensity and duration. As well, size of fish and continuity of supply can be adjusted to suit market conditions. Although this system of aquaculture is successful in other countries around the world, it is still in its infancy in Canada, and almost non-existent in Saskatchewan. Few aquaculture enterprises here can be termed 'intensive'. In 1985, there were only three private rainbow trout hatcheries (increased to five in 1986), and a half-dozen experimental cage-rearing growout operations. The former currently raise fish to the fingerling stage; the latter grow fingerlings to table size.

In recent years, development of the aquaculture industry has attracted a great deal of interest across Canada. The main reasons for this are:

- the demonstrated success of aquaculture in other countries, particularly Norway which has a similar coast and climate to Canada.
- a strong and increasing market demand in Canada and export markets for an assured supply of quality fresh fish and seafood. Since the wild fish resource has been fully allocated, any increase in fish production must come from the aquaculture sector.

- the opportunity to replace aquaculture imports from other countries.
- the employment and income associated with a strong aquaculture industry.
- new advances in research and development, fish health and feed supply which support industry growth.
- an abundance of good, clean water.

In recognition of the potential which aquaculture presents, the Science Council of Canada and the Department of Fisheries & Oceans (DFO) co-sponsored the first National Aquaculture Conference in St. Andrews, New Brunswick, in 1983. It was well attended by the private sector, the research community, and different levels of government. The Conference concluded that aquaculture represents a bright development opportunity for Canadians, as stated in its final report:

> "For Canada, commercial aquaculture means an opportunity to substantially increase exports, create new jobs, provide supplemental employment and income opportunities within the traditional commercial fishery, and to expand support industries that provide equipment, supplies and services. Furthermore, aquaculture has an important role to play in enhancing stocks of fish for the recreational and commercial fisheries. Canada's abundant resource base, both fresh and salt water, is more than adequate to support an aquaculture industry of major dimensions."

The Conference strongly urged the Government of Canada to designate aquaculture as a high-priority opportunity for development.

Since the Conference, the Science Council has prepared a development plan for aquaculture in Canada, and a statement on the opportunity aquaculture holds for Canadians. In the latter document, the Science Council recommended that

federal and provincial governments state clearly their intention to develop a commercial aquaculture industry in Canada.

In response to this recommendation, the DFO held a series of meetings with provincial government officials across Canada to discuss ways to facilitate industry development. As well, DFO has prepared a discussion paper, "Developing Aquaculture in Canada", which identifies current development constraints and attempts to clarify the roles of government and industry. The paper proposes an agenda for development of aquaculture in Canada. Its main points are:

- aquaculture should be designated as a priority by governments and the private sector.
- the private sector should have the lead role in commercial developments; the public sector should play a support role.
- government support is required in areas such as research and extension.
- tripartite (federal, provincial, industry) committees should be set up at a regional level to advise governments on aquaculture policy and programs, to plan development strategies, to promote the industry's growth, and to inform industry on government activities.
- the regulatory framework needs to be clarified.

Saskatchewan Parks and Renewable Resources (SPRR) has responded by identifying aquaculture as a development opportunity and by producing this development plan for Saskatchewan aquaculture. **As the lead provincial department for aquaculture development, SPRR recommends the following to assist and promote commercial aquaculture in Saskatchewan:**

## THE SASKATCHEWAN AQUACULTURE DEVELOPMENT PLAN

### 1. Recognition of the Industry

Aquaculture should be recognized as a distinct new industry. This would assist in gaining recognition for water rights, land leases and financial assistance. Formal recognition can be accomplished through government policy, and/or by legislation.

### 2. Provincial Lead Agency

Constitutionally, the Department of Fisheries & Oceans has jurisdiction over all fisheries in Canada. In 1930, under the Transfer of Natural Resources Act, responsibility for administration of Saskatchewan's fisheries was transferred to the province. A further distinction can be made that, since the fish being cultured are private property, administration falls within provincial jurisdiction. SPRR has been active in the promotion and administration of aquaculture since the activity started in Saskatchewan in 1970. SPRR's mandate as the lead provincial government department responsible for aquaculture was officially reconfirmed in 1985.

### 3. Federal-Provincial Co-ordination

The federal and provincial governments have overlapping jurisdictions in the area of aquaculture. To date, this has resulted in an unorganized approach towards aquaculture development. This problem has been recognized by both levels of government, with the result that steps are being taken to delineate respective areas of responsibility.

In the 1986 Nielsen Task Force Report on Aquaculture a recommendation was made that DFO negotiate and sign a memorandum of understanding with each province with a view to:

"a) Define the areas of responsibility of each level of government relating to aquaculture.

b) Delegate as much of the management of aquaculture to provinces as is practical, subject to the continuing need of the federal government to regulate fish habitat and disease, and navigation, and the need for this industry to have access to federal scientific expertise.

c) Simplify the regulatory burden on the industry, specifically as it affects new entrants."

Such federal-provincial cooperation is particularly vital in provinces where aquaculture utilizes marine waters normally under federal control. Hence, the first of these agreements has been negotiated between the federal government and the Province of Nova Scotia. Negotiations will commence shortly for development of a similar agreement between the Government of Canada and Saskatchewan.

## 4. Industry - Government Coordination

A Regional Aquaculture Advisory Committee is recommended to coordinate development of aquaculture on the prairies. The aquaculture needs of the prairie region are unique from those of the east and west coasts, and other areas in Canada where climate and ecological features differ. The committee should be chaired by the DFO's Prairie Provinces Aquaculture Coordinator, with membership comprised of the provincial aquaculture coordinators from Saskatchewan, Manitoba and Alberta,

and representatives from the industry. The Committee would provide government-industry liaison, advise governments on aquaculture policy and programs, plan development strategies, promote the industry's growth, and oversee the collection and publication of statistics. Activities would a so include evaluation of proposals for government-funded projects (studies, research, pilot projects) to ensure they are meaningful and in line with aquaculture development requirements. Should the provinces of Alberta and Manitoba not wish to participate in this Committee, Saskatchewan should strive for a federal-provincial Committee of this nature nonetheless.

## 5. Regulations

A large number of federal and provincial government agencies have regulatory jurisdiction over various aspects of the aquaculture industry. Because of the number of contacts required, private developers have experienced difficulties in the past in obtaining necessary approvals and licences for new intensive aquaculture developments. In order to promote industry development and speed the approval process, SPRR Fisheries Branch will act as the coordinator for new development proposals. When provided with details of a proposed development, Fisheries Branch will coordinate input and approvals from all appropriate agencies.

Addendum I lists federal and provincial government agencies whose jurisdictions extend to aquaculture, and their areas of involvement.

Saskatchewan's current aquaculture regulations and policy are viewed by some as being unnecessarily restrictive, hindering development of the industry in the province. To a certain extent this is true, as both the existing regulations and policy were developed before the emergence of intensive aquaculture activity in the province. As a result, their focus is mainly on extensive aquaculture using rainbow trout.

Due to the application of new technology and new methods in aquaculture (e.g. raceway and cage culture), SPRR recognizes the need for a new, more responsive aquaculture policy. The main thrusts of the proposed policy are included as Addendum II of this discussion paper. The policy will allow a wider range of aquaculture activities to occur, while still providing protection for native fish populations, fish health, and water quality.

Aquaculture legislation compatible with the direction of the new policy is scheduled for development in 1987 after receiving public and industry input on this document.

## 6. Fish Health

DFO is responsible for protection of fish health across Canada. Under authority of the federal Fish Health Protection Regulations, they are responsible for fish health inspection and the certification of all facilities intending to market live or dead (table) fish across provincial boundaries. In Saskatchewan, administration of the fish health program is carried out by the Local Fish Health Officer, SPRR Fisheries Branch.

The new aquaculture policy proposes to allow the culture of species other than rainbow trout, and the expansion of fish farming operations to waters containing wild fish populations. This calls for increased emphasis on fish health in order to provide adequate protection for natural fish stocks. It is proposed, therefore, that all facilities in Saskatchewan which sell live fish be enrolled in a fish health certification program, and that DFO retain responsibility for the program. This applies primarily to hatcheries, but also includes other facilities wishing to sell live fish, e.g., brokers and distributors.

In addition, all salmonids (both dead and alive) exported from the province must be certified as specified in Schedules II and III of the Fish Health Protection Regulations.

While the fish health certification program is not a new requirement, it is important that it is maintained if we are to create a reputation as a province which produces high-quality, disease-free aquaculture products.

## 7. Research and Development

Scientists at DFO's Freshwater Institute in Winnipeg carry out research of broad regional interest to aquaculturists in the prairie provinces. In the past, SPRR has undertaken research in various aspects of aquaculture, but in recent years its activities have been redirected towards native fish stock maintenance and enhancement. The Saskatchewan Research Council

(SRC) has become the main provincial agency undertaking aquaculture research in Saskatchewan. To a lesser degree, universities in western Canada are also able to undertake studies related to aquaculture. It is apparent, however, that additional development-oriented and operational research is required in areas such as genetics, nutrition, fish health, physiology, biotechnology and food science.

One of the main responsibilities of the Regional Aquaculture Advisory Committee should be identification of research required to further develop the aquaculture industry on the prairies, and securement of funds to carry it out. Funds for research and development are available from the following federal and provincial government agencies:

a) **Federal**

i) **Department of Fisheries and Oceans (DFO)**
- The Unsolicited Proposals Program (operated in conjunction with the Department of Supply and Services) may grant funds for innovative private sector aquaculture research.
- Funds for research and development may also be available through various Subsidiary Agreements under the Economic Regional Development Agreements (ERDA) between Canada and the provinces.

ii) **National Research Council (NRC)**
- Aquaculture research and development is supported through two broad programs, the Industrial Research Assistance Program (IRAP), and the interdepartmental Program for Industry/Laboratory Projects (PILP).

Both programs relate to research carried out in federal government laboratories and universities.

iii) **Department of Regional Industrial Expansion (DRIE)**

- Although the Industrial and Regional Development Program (IRDP) does not provide assistance for primary aquaculture research, it may provide funds for related activities such as processing, feed formulation, and the development of equipment.

iv) **Department of Energy, Mines and Resources (EMR)**

- EMR administers the Industry Energy Research and Development Program (IERD) which supports research into the use of waste heat for aquaculture.

**b) Provincial**

i) **Northern Affairs Secretariat (NAS)**

- NAS, in conjunction with DRIE, administers the Northern Economic Development Subsidiary Agreement (NEDSA), which provides financial assistance for project planning, feasibility studies, and economic development of northern renewable resources, including aquaculture. Saskatchewan residents living north of Prince Albert are eligible.

ii) **Department of Science and Technology (S & T)**

- The Industrial Research and Development Fund provides assistance for research and development of new processes, techniques and products.

- The Inventor Services Program assists with the evaluation of new inventions and ideas, including those related to aquaculture.
- Under the federal-provincial Economic Regional Development Agreement, S & T administers the Advanced Technology Agreement Programs, which are aimed at a number of areas of advanced technology.

iii) **Department of Agriculture**

- Saskatchewan Agriculture administers the Agriculture Development Fund, which is designed to finance research, development and demonstrations which reflect the practical needs of Saskatchewan farmers (including aquaculturists).

## 8. Financing

A major problem with developing a new industry is finding adequate sources of funding to finance initial developments. Because the technology is new to the province and may require modification or further development to adapt it to local conditions, lending institutions are hesitant to provide financial backing. As a result, aquaculture operations are underfinanced and are, therefore, more prone to failure than if they had adequate financial backing.

SPRR agrees with the recommendation of the Nielsen Task Force Report on Aquaculture in that government should consider aquaculture as any other business; this would make it eligible for funding from the following federal government business programs:

i) **Department of Regional Industrial Expansion (DRIE)**

- Although primary businesses such as aquaculture production facilities are not eligible for

assistance under the Small Business Loans Act (SBLA), secondary businesses such as processing plants, feed plants, and manufacture of aquaculture-related equipment are.

ii) **Federal Business Development Bank (FBDB)**

- The FBDB offers the following services to small and medium sized businesses (including aquaculture):

  Financial services - loans, loan guarantees, financial planning.

  Investment banking - equity financing

  Management services - counselling, training and information.

iii) **Department of Indian and Northern Affairs**

- Indian and Northern Affairs funds the provincially administered Saskatchewan Indian Agricultural Program (SIAP) which provides extension services, and development grants and loans for economically viable agriculture operations (including aquaculture) by Treaty Indians.

In addition to the federal business programs, monies for aquaculture development are available from the following provincial government agencies:

i) **Department of Tourism and Small Business (TSB)**

- Under the Northern Saskatchewan Revolving Fund, TSB provides business loans to residents of the Northern Administration District.
- TSB also administers the Small Business Interest Reduction Program. The purpose of this program is to assist eligible small business by reducing the costs of both operating and term loans.

ii) **Department of Economic Development and Trade (EDT)**

- EDT administers the Industry Incentives Program which subsidizes new jobs created which last a minimum of one year.
- The Market Development Fund partially finances or subsidizes marketing efforts such as advertising, brochures, and attendance at trade shows.
- EDT also cost shares market benefit studies on a 50/50 basis with established businesses.

iii) **Saskatchewan Economic Development Corporation (SEDCO)**

- Aquaculture qualifies under all SEDCO programs. Loans are available for capital expenditures such as land, buildings and equipment, but not operating costs.

Funding for aquaculture developments is also available from private lending institutions such as banks, credit unions and loan companies.

## 9. Extension Services

Commercial applications of aquaculture will require comprehensive extension support to maximize success. The responsibility for supplying extension services regarding regulatory and technical aspects will lie with SPRR.

Assistance and information concerning regulations affecting the industry (licensing, marketing, fish health regulations and environmental requirements) is

available from SPRR, Fisheries Branch, Prince Albert. Information and advice regarding technical aspects of fish culture is available from the Provincial Fish Culture Station in Fort Qu'Appelle.

Fisheries Branch also has information available regarding a number of specific problems which concern fish farmers, such as feeding of trout, aeration, control of predators, algae control and muddy flavour, and is preparing information on cage culture, raceway operations and other topics.

Technical assistance from other agencies such as SRC, DFO and other provinces can also be arranged through SPRR Fisheries Branch.

## 10. Education and Training

The SRC currently offers the majority of education and training for intensive aquaculturists in Saskatchewan. This training consists of a two-day general fish farming course, and a two-week intensive fish culture course, offered every other year. Most of the private hatchery operators in the province attended the two-week course prior to starting up their operations.

The SRC is expected to continue its lead role in aquaculture education and training, but may consider expansion of course offerings to include more detailed topics on aquaculture technology, nutrition, fish health, water quality management, financial management and marketing.

At the present time, no other formal training facilities exist elsewhere on the prairies; however, the University of Manitoba plans to offer an undergraduate class in aquaculture in the fall of 1986. As the demand for aquaculture courses increases, other prairie universities may follow suit.

The only comprehensive aquaculture training offered presently in western Canada is the Aquaculture and Fisheries Technology Program at Malaspina College in Nanaimo, British Columbia. Graduates of this 2-year program are qualified to operate fish production facilities and carry out research in production methods. As the aquaculture industry develops in B.C. and the rest of Canada, graduates from Malaspina College will be in demand.

## 11. Statistics

Throughout most of Canada, aquaculture production statistics are submerged in other programs. As a result, the industry has not developed a visible identity. In Saskatchewan, SPRR has collected and maintained aquaculture statistics since the industry started and this function will be continued. Availability of up-to-date statistics benefits industry development by identifying the direction and magnitude of industry trends. This allows producers to more accurately forecast markets and prices, and government agencies to channel research funds into areas of aquaculture where they are most needed.

## 12. Cultured Species

While the draft Aquaculture Policy (highlights of which are listed in Addendum II) proposes that a wide range of species be allowed for aquaculture, the developing industry in Saskatchewan must concentrate on the production of high value products, not simply the production of fish protein. There is no shortage of low value fish throughout most of the world. In Saskatchewan and other provinces, there are large stocks of unexploited low value species, such as carp, cisco and suckers. Consumer demand is for high value, high quality fish products.

This point was identified at the 1983 National Aquaculture Conference. If aquaculture is to succeed as an industry in Canada, the culture of high value species must be stressed in order to compete with aquaculture products from other countries. The emphasis on the east and west coasts of Canada will be toward the culture of salmon species, lobster and various species of shellfish.

Rainbow trout culture presently forms the backbone of freshwater aquaculture. Due to strong competition from existing trout producers in the United States, Saskatchewan aquaculture cannot rely on rainbow trout alone to support a large provincial industry. In order for aquaculture to assume economic significance in Saskatchewan, research must be carried out to identify and develop additional high value species suitable for culture. One species with such potential is Arctic char. This is due to its high value, apparent good growth rate, and the fact that it has no direct market competition from producers in other countries.

## 13. Need for Brood Stock

Saskatchewan aquaculture is currently limited to the production of rainbow trout which originate from outside the province either as eggs or fingerlings. Because the Saskatchewan industry is dependent on outside sources for all stock, there is an uncertainty of supply associated with it. Development of broodstocks for non-governmental, commercial use within the province would provide local hatcheries with a reliable local source of eggs, and would guarantee adequate fish supply for the development of an intensive growout industry.

The possibility of utilizing native species for aquaculture purposes is addressed in Addendum II.

## 14. Marketing

To date, marketing of aquacultural products has received very little attention. Most fish farmers have had few problems selling the small volumes of rainbow trout produced directly to consumers proximate to production centres. Recently, however, concerns have been expressed that Saskatchewan markets may be insufficient to support significantly increased production.

This concern prompted the federal and provincial governments to commission a marketing study of the Saskatchewan industry through the joint ERDA Sub-Agreement on Planning. The study addresses two main areas - a profile of the current industry, and an assessment of marketing opportunities.

Although the final report of the study is not due until July, 1986, preliminary results indicate that some opportunity for increased sales of rainbow trout does exist. An organized, aggressive marketing effort will be required to develop this potential market successfully.

The report suggests that the most effective method of marketing fish-farmed products by a large number of individuals is via a producer-operated marketing organization. This assumes the marketing body has the strength and knowledge needed for effective marketing and operates with the interests of its membership at heart. This approach is used successfully by small trout producers in Idaho, and by most Ontario producers.

An effective marketing organization provides the following benefits:

- wholesalers and retailers need contact only one supplier to obtain aquaculture products.
- harvesting and marketing can be ordered so that the market is not flooded by large numbers of fish entering it at one time, driving prices down.
- a guaranteed year-round supply of processed fish is provided in order to obtain, hold and expand markets.
- the association can guarantee that only high quality fish are marketed, thereby ensuring customer satisfaction and future sales.

Currently, export and interprovincial sales of cultured rainbow trout are administered by the Freshwater Fish Marketing Corporation (FFMC) under Special Dealers

Licences, in the same manner as commercially caught fish. SPRR Fisheries Branch intends to clarify whether the Freshwater Fish Marketing Act contains authority for marketing of aquaculture products.

The philosophy underlying this Development Plan is that the industry should be driven by the private sector. With this fundamental thought in mind, industry support for a producer-owned and operated marketing mechanism should be ascertained.

## 15. Fish Quality

A key component to the future success of the aquaculture industry will lie in its ability to produce and maintain a high quality product for the consumer. Many types of fish are on the market and competition with commercially taken fish and other aquaculture products will be intense.

Recent concerns over poor fish quality tend to indicate consumers expect assurance from government that perishable products such as fish are safe to eat. For this reason, the basic level of fish quality standards already existing under the Saskatchewan Fish Marketing Regulations will be applied to aquaculture products. Aspects of fish quality under these regulations will be administered and enforced jointly by SPRR field officers and Saskatchewan Health inspectors.

These regulations detail requirements for plant facilities and handling procedures, as well as general provisions for safe transportation and storage. This is not only necessary for consumer protection, but is essential if fish-farmed products are to gain acceptance and be successful in the marketplace.

## 16. Fish Feed Supply

Development of a fish feed manufacturing plant in the province would be desirable. Such a facility could serve the entire prairie region. Existing hatcheries (both government and private) must currently import feed from British Columbia, Ontario or the United States. Feed imported into Saskatchewan is expensive, with freight charges comprising as much as 50 percent of its cost. A dependable, reasonably priced local feed supply will be an important element in the development of a healthy prairie aquaculture industry.

## Concluding Comment

While commercial aquaculture is an industry which appears to have considerable potential for growth, the lead role in industry development must remain with the private sector. Government's role should be supportive: to provide a suitable investment climate, to clarify and simplify the regulatory framework, and to assist industry in overcoming obstacles inhibiting growth.

**Addendum I**

## Aquaculture - Areas of Responsibility

1. **Private Sector**
   - project proposals
   - project financing and development
   - operation of aquaculture facilities
   - processing and marketing
   - maintenance of fish health and fish quality

2. **Provincial Government**

   a) **Parks and Renewable Resources, Fisheries Branch**
      - administration
      - regulations/policy
      - extension services
      - compilation and publication of statistics
      - coordination of project proposal review
      - fish health administration
      - fish quality inspection/enforcement

   b) **Parks and Renewable Resources, Lands Branch**
      - administration of docks and building permits, land tenure and road construction (in provincial forests only)

   c) **Saskatchewan Research Council**
      - aquaculture research and development
      - education and training
      - technology transfer

   d) **Tourism and Small Business**
      - industry promotion
      - business consultation
      - loans to residents of Northern Administration District (NAD)

e) **Environment, Water Pollution Control Branch**
   - effluent treatment and disposal

f) **Environment, Co-ordination and Assessment Branch**
   - project proposal review
   - environmental impact assessment

g) **Saskatchewan Water Corporation**
   - water rights allocation and licensing

h) **Science and Technology**
   - industry promotion
   - research grants

i) **Economic Development and Trade**
   - industry promotion
   - research grants

j) **Agriculture**
   - Land tenure on Crown lands south of provincial forest.
   - research and development grants

k) **Health, Community Health Services Branch**
   - fish quality

l) **Northern Affairs Secretariat**
   - research and development grants

m) **Saskatchewan Economic Development Corporation**
   - loans to aquaculture businesses

3. **Federal Government**

a) **Fisheries and Oceans, Freshwater Institute**
   - fish health regulations (Ottawa)
   - fish health inspection and certification
   - research and development
   - technology transfer

**Addendum I**

## Aquaculture - Areas of Responsibility

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m) **Saskatchewan Economic Development Corporation**
- loans to aquaculture businesses

3. **Federal Government**

a) **Fisheries and Oceans, Freshwater Institute**
- fish health regulations (Ottawa)
- fish health inspection and certification
- research and development
- technology transfer

b) **National Research Council**

- research grants
- research and development

c) **Supply and Services**

- research grants

d) **Regional Industrial Expansion**

- assistance to aquaculture-related secondary industries (grants, loans)

e) **Federal Business Development Bank**

- loans to aquaculture businesses

f) **Science Council of Canada**

- industry promotion

g) **Energy, Mines and Resources**

- research grants for waste heat aquaculture projects

h) **Agriculture**

- licensing of antibiotics and fish vaccines
- fish feed labelling

i) **Canadian Coastguard, Navigational Waters Protection Authority**

- approval of developments which may interfere with navigation

j) **Indian and Northern Affairs**

- extension services
- development grants and loans

) for Treaty Indians

**Addendum II**

## Proposed Thrusts of New Saskatchewan Aquaculture Policy

The following list summarizes only those proposed major initiatives which would be new for aquaculture in Saskatchewan. A detailed Aquaculture Policy statement will be developed after the public has had an opportunity to comment on this Position Paper.

### A. Types of Culture Operations

- Extensive aquaculture will be allowed in winterkill lakes/ponds with intermittent outflows, provided the outlet is screened to prevent escape of fish.

- Cage culture will be permitted in non-winterkill lakes containing native fish species, with certain restrictions.

- Raceway and tank culture operations will be permitted using water from ground sources, natural springs, streams or lakes. Effluent treatment will have to comply with Saskatchewan Environment's requirements.

### B. Species of Fish which may be Cultured

- All species and hybrids of the family **Salmonidae** will be permitted for culture in any water of the province.
  - only certified disease-free stocks will be permitted into waters containing native species or into waters with intermittent outlets.

- uncertified salmonids from local hatcheries will be permitted to be stocked into totally landlocked, winterkill waters only.

- **Native** species will be allowed for intensive culture, provided they are present in the local watershed.
  - species native to the province, but not in the local watershed, will be allowed for aquaculture in certain circumstances.
  - native fish stocks for brood purposes will be obtainable from public waters in the province for an established fee.
  - eggs, fry or fingerlings will be sold to aquaculturists from the provincial Fish Culture Station at actual production cost, provided sufficient stocks are available.

- **Introduced** species, meaning those species not native to Saskatchewan but not including salmonids, will be allowed for culture in totally self-contained intensive facilities only (i.e., recirculating culture systems in which effluent cannot enter natural water systems).
  - sales of introduced species will be permitted for consumption only, with no stocking out of live fish allowed.

## C. Fish Health

- All salmonid hatcheries and growout facilities will be provided with fish health inspection and certification services at no cost to the producer.

- Fish originating from facilities with non-certified status may be allowed to be stocked in landlocked, winterkill waters, depending on the type and severity of disease present.

- Should either of the two "emergency diseases" (whirling disease or Ceratomyxosis) be found in a facility, all stocks will have to be destroyed.

**D. Land Tenure in the Provincial Forest**

- Land based structures, docks and access trails through the forest which are a necessary and integral part of an aquaculture operation will be authorized in the northern provincial forest in much the same manner as for wild rice operations.